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[Answering Queries Using Views - Levy, Mendelzon, Sagiv, Srivastava \(1995\)](#) (Correct) (255 citations)  
and performance evaluation of the ADMS **query optimizer**: Integrating query result caching and views. Aside from its potential in **optimizing query** evaluation, the problem also arises in  
[ftp.db.toronto.edu/pub/papers/pods95LMSS.ps.Z](http://ftp.db.toronto.edu/pub/papers/pods95LMSS.ps.Z)

[DataGuides: Enabling Query Formulation and Optimization in... - Goldman, Widom \(1997\)](#) (Correct) (216 citations)

as statistics and sample values, and enabling **query optimization**. This paper presents the theoretical to any fixed schema or class hierarchy. For **query optimization**, we show how the DataGuide can be used as a means of guiding the query processor and **optimizing query** execution. 1. Introduction Traditional  
[www-db.stanford.edu/~royg/pubs/dataguide\\_vldb97.ps](http://www-db.stanford.edu/~royg/pubs/dataguide_vldb97.ps)

[W3QS: A Query System for the World-Wide Web - Konopnicki \(1995\)](#) (Correct) (107 citations)

indexes and available libraries for **optimizing query** processing. Related work Due to the space  
[www.cs.technion.ac.il/~konop/robot.ps.gz](http://www.cs.technion.ac.il/~konop/robot.ps.gz)

[Access Support in Object Bases - Alfons Kemper \(1990\)](#) (Correct) (54 citations)

implemented we are currently working on the **query optimizer** that transforms queries with path we are currently developing a rule-based **query optimizer** [5]Acknowledgements Peter Lockemann and relations are introduced as a means for **optimizing query** processing in object-oriented database  
[pi3.informatik.uni-mannheim.de/publications/sigmod90.ps](http://pi3.informatik.uni-mannheim.de/publications/sigmod90.ps)

[Data Warehouse Configuration - Theodoratos, Sellis \(1997\)](#) (Correct) (30 citations)

In [13] the problem is addressed in its **query optimization** form in the context of aggregations and another two related problems are the multiple-**query optimization** problem [26, 27] the caching problem is additionally considered. The problem of **optimizing query** evaluation in the presence of materialized  
[140.115.82.191/old/warehouse/paper.ps](http://140.115.82.191/old/warehouse/paper.ps)

[Incremental Updates of Inverted Lists for Text Document... - Tomasic, Garcia-Molina, ... \(1993\)](#) (Correct) (29 citations)

over the disk) and the update time for the **query optimized** policy is poor (since reads are intermixed a list is generated for each update. For the **query optimized** policy, the portion of the list written on which range from optimizing update time to **optimizing query** performance is described. We quantitatively  
[db.stanford.edu/pub/tomasic/1993/stan.cs.tn.93.1.ps](http://db.stanford.edu/pub/tomasic/1993/stan.cs.tn.93.1.ps)

[Access Support Relations: An Indexing Method for Object Bases - Kemper, Moerkotte \(1992\)](#) (Correct) (20 citations)

For this purpose we developed a rule-based **query optimizer** for GOM that generates a query evaluation cost model is being incorporated into the **query optimizer** for comparing the evaluation costs of relations are introduced as a means for **optimizing query** processing in object-oriented database  
[www.cs.brown.edu/courses/cs227/papers/b3/access.ps](http://www.cs.brown.edu/courses/cs227/papers/b3/access.ps)

[Optimizing View Queries in ROLEX to Support... - Bohannon, Ganguly.. \(2002\)](#) (Correct) (11 citations)

for lazy materialization. The ROLEX **query optimizer** uses a characterization of the navigation including its model of query execution and the **query optimizer**. We demonstrate with a performance study the of the ROLEX approach and the importance of **optimizing query** execution for navigation. 1 Introduction  
[www.bell-labs.com/user/bohannon/Papers/RolexVLDB.ps](http://www.bell-labs.com/user/bohannon/Papers/RolexVLDB.ps)

[Generalized Projections: A Powerful Approach to Aggregation - Gupta, Harinarayan, Quass \(1995\)](#) (Correct) (9 citations)

data warehousing, materialized views, **query optimization** 1 Introduction With the growing number implemented in the same module in existing **query optimizers** [G93]We present a set of query rewrite

and join. For this reason, rewrite rules for **optimizing query** trees almost never involve aggregation  
[www-db.stanford.edu/pub/papers/GP2.ps](http://www-db.stanford.edu/pub/papers/GP2.ps)

Combining Pat-Trees and Signature Files for Query Evaluation .. - Yangjun Chen And (1999) (Correct) (4 citations)

techniques: signature files and pat-trees for **optimizing query** evaluation in document databases. Signature  
[www.darmstadt.gmd.de/oasys/reports/ftp/pdf/P1999-14.pdf](http://www.darmstadt.gmd.de/oasys/reports/ftp/pdf/P1999-14.pdf)

New Static Scheduling and Elastic Load Balancing Methods.. - Brunie, Kosch, Flory (1995) (Correct) (4 citations)

for future database applications [1]Parallel **query optimization** is the parallelization of an input query  
 2 analyzes different approaches to parallel **query optimization** and dynamic load balancing. Section 3  
[www.ens-lyon.fr/~hkosch/IEEE2.ps.gz](http://www.ens-lyon.fr/~hkosch/IEEE2.ps.gz)

Mnesia - A Distributed Robust DBMS for.. - Mattsson, Nilsson.. (1999) (Correct) (4 citations)

part of the actual Erlang syntax, whereas the **optimizing query** compiler and evaluator are regular Erlang  
 databases. Queries are compiled by an **optimizing query** compiler which has been integrated with the  
 from low level storage management to the **optimizing query** compiler, consists of less than 15000 lines  
[www.ericsson.se:800/cslab/~klacke/iss.ps](http://www.ericsson.se:800/cslab/~klacke/iss.ps)

A Logic-Agent based System for Semantic Integration - Sadri, Toni, Xanthakos (2000) (Correct) (3 citations)

ontological mismatches, semantically **optimizing query**-plans using known integrity constraints  
[www-lp.doc.ic.ac.uk/UserPages/staff/ft/PAPERS/codata.ps.Z](http://www-lp.doc.ic.ac.uk/UserPages/staff/ft/PAPERS/codata.ps.Z)

Efficient Query Reformulation in Peer Data Management Systems - Tatarinov, Halevy (2004) (Correct) (2 citations)

This paper describes several methods for **optimizing query** reformulation in a PDMS, and evaluates their  
 environment, different metrics can be used to **optimize query** reformulation in a PDMS. The optimizations  
 TECHNIQUES We now describe the methods for **optimizing query** reformulation in a PDMS. For each method  
 we  
[www.cs.washington.edu/homes/igor/myweb/.../research/sigmod2004.pdf](http://www.cs.washington.edu/homes/igor/myweb/.../research/sigmod2004.pdf)

Optimized Query Execution in Large Search Engines with Global.. - Long, Suel (2003) (Correct) (2 citations)

this gap. In particular, we are interested in **optimizing query** performance, as measured by query  
[cis.poly.edu/~suel/papers/order.pdf](http://cis.poly.edu/~suel/papers/order.pdf)

The Object-Slicing Technique: A Flexible Object Representation.. - Harumi Kuno (1995) (Correct) (2 citations)

ffl Present the experimental results of **optimizing query** types from the OO7 benchmark on the  
[ftp.eecs.umich.edu/techreports/cse/1995/CSE-TR-241-95.ps.Z](http://ftp.eecs.umich.edu/techreports/cse/1995/CSE-TR-241-95.ps.Z)

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### 1 [Multidatabase systems: Query optimization in multidatabase systems](#)

Qiang Zhu

 November 1992 **Proceedings of the 1992 conference of the Centre for Advanced Studies on Collaborative research - Volume 2**

 Full text available: [pdf\(1.03 MB\)](#)

 Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

A multidatabase system (MDBS) integrates information from autonomous local databases managed by heterogeneous database management systems (DBMS) in a distributed environment. For a query involving more than one database, global query optimization should be performed to achieve good overall system performance. The significant differences between an MDBS and a traditional distributed database system (DDBS) make query optimization in the former more challenging than in the latter. Challenges for qu ...

**Keywords:** adaptive query optimization, distributed query optimization, multidatabase system, parametric query optimization, probing query, query processing, semantic query optimization

### 2 [Logic-based approach to semantic query optimization](#)

Upen S. Chakravarthy, John Grant, Jack Minker

 June 1990 **ACM Transactions on Database Systems (TODS)**, Volume 15 Issue 2

 Full text available: [pdf\(3.46 MB\)](#)

 Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The purpose of semantic query optimization is to use semantic knowledge (e.g., integrity constraints) for transforming a query into a form that may be answered more efficiently than the original version. In several previous papers we described and proved the correctness of a method for semantic query optimization in deductive databases couched in first-order logic. This paper consolidates the major results of these papers emphasizing the techniques and their applicability for optimizing rel ...

### 3 [Parametric query optimization](#)

Yannis E. Ioannidis, Raymond T. Ng, Kyuseok Shim, Timos K. Sellis

 May 1997 **The VLDB Journal — The International Journal on Very Large Data Bases**, Volume 6 Issue 2

 Full text available: [pdf\(378.53 KB\)](#)

 Additional Information: [full citation](#), [abstract](#), [citations](#), [index terms](#)

In most database systems, the values of many important run-time parameters of the system, the data, or the query are unknown at query optimization time. Parametric query

optimization attempts to identify at compile time several execution plans, each one of which is optimal for a subset of all possible values of the run-time parameters. The goal is that at run time, when the actual parameter values are known, the appropriate plan should be identifiable with essentially no overhead. We present a g ...

#### 4 Description logics for semantic query optimization in object-oriented database systems

Domenico Beneventano, Sonia Bergamaschi, Claudio Sartori

March 2003 **ACM Transactions on Database Systems (TODS)**, Volume 28 Issue 1

Full text available:  [pdf\(406.56 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Semantic query optimization uses semantic knowledge (i.e., integrity constraints) to transform a query into an equivalent one that may be answered more efficiently. This article proposes a general method for semantic query optimization in the framework of Object-Oriented Database Systems. The method is effective for a large class of queries, including conjunctive recursive queries expressed with regular path expressions and is based on three ingredients. The first is a Description Logic, ODL

**Keywords:** Semantic query optimization, description logics, integrity constraints rules, query rewriting method, semantic expansion of a query, subsumption

#### 5 Query Optimization in Database Systems

Matthias Jarke, Jurgen Koch


June 1984 **ACM Computing Surveys (CSUR)**, Volume 16 Issue 2

Full text available:  [pdf\(2.84 MB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

#### 6 A method for automatic rule derivation to support semantic query optimization

Michael Siegel, Edward Sciore, Sharon Salveter

December 1992 **ACM Transactions on Database Systems (TODS)**, Volume 17 Issue 4

Full text available:  [pdf\(2.73 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)


The use of inference rules to support intelligent data processing is an increasingly important tool in many areas of computer science. In database systems, rules are used in semantic query optimization as a method for reducing query processing costs. The savings is dependent on the ability of experts to supply a set of useful rules and the ability of the optimizer to quickly find the appropriate transformations generated by these rules. Unfortunately, the most useful rules are not always th ...

**Keywords:** integrity constraint, learning, transformation heuristic

#### 7 Efficient and extensible algorithms for multi query optimization

Prasan Roy, S. Seshadri, S. Sudarshan, Siddhesh Bhobe

May 2000 **ACM SIGMOD Record , Proceedings of the 2000 ACM SIGMOD international conference on Management of data**, Volume 29 Issue 2

Full text available:  [pdf\(197.59 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)


Complex queries are becoming commonplace, with the growing use of decision support systems. These complex queries often have a lot of common sub-expressions, either within a single query, or across multiple such queries run as a batch. Multiquery optimization aims at exploiting common sub-expressions to reduce evaluation cost. Multi-query optimization has hither-to been viewed as impractical, since earlier algorithms were exhaustive, and explore a doubly exponential search space.

In t ...

### 8 Query optimization on local area networks

Alan R. Hevner, O. Q. Wu, S. B. Yao

January 1985 **ACM Transactions on Information Systems (TOIS)**, Volume 3 Issue 1

Full text available:  [pdf\(1.75 MB\)](#)


Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Local area networks are becoming widely used as the database communication framework for sophisticated information systems. Databases can be distributed among stations on a network to achieve the advantages of performance, reliability, availability, and modularity. Efficient distributed query optimization algorithms are presented here for two types of local area networks: address ring networks and broadcast networks. Optimal algorithms are ...

### 9 Stochastic query optimization in distributed databases

P. E. Drenick, E. J. Smith

June 1993 **ACM Transactions on Database Systems (TODS)**, Volume 18 Issue 2

Full text available:  [pdf\(1.64 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#), [review](#)

Many algorithms have been devised for minimizing the costs associated with obtaining the answer to a single, isolated query in a distributed database system. However, if more than one query may be processed by the system at the same time and if the arrival times of the queries are unknown, the determination of optimal query-processing strategies becomes a stochastic optimization problem. In order to cope with such problems, a theoretical state-transition model is presented that treats the s ...

**Keywords:** distributed query processing, state-transition model, stochastic query optimization

### 10 Iterative dynamic programming: a new class of query optimization algorithms

Donald Kossmann, Konrad Stocker

March 2000 **ACM Transactions on Database Systems (TODS)**, Volume 25 Issue 1

Full text available:  [pdf\(955.89 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)


The query optimizer is one of the most important components of a database system. Most commercial query optimizers today are based on a dynamic-programming algorithm, as proposed in Selinger et al. [1979]. While this algorithm produces good optimization results (i.e, good plans), its high complexity can be prohibitive if complex queries need to be processed, new query execution techniques need to be integrated, or in certain programming environments (e.g., distributed database systems). In ...

**Keywords:** dynamic programming, greedy algorithm, iterative dynamic programming, plan evaluation function, query optimization, randomized optimization

### 11 OPT++ : an object-oriented implementation for extensible database query optimization

Navin Kabra, David J. DeWitt

April 1999 **The VLDB Journal — The International Journal on Very Large Data Bases**, Volume 8 Issue 1

Full text available:  [pdf\(167.26 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [citations](#), [index terms](#)

In this paper we describe the design and implementation of OPT++, a tool for extensible database query optimization that uses an object-oriented design to simplify the task of implementing, extending, and modifying an optimizer. Building an optimizer using OPT++


makes it easy to extend the query algebra (to add new query algebra operators and physical implementation algorithms to the system), easy to change the search space, and also to change the search strategy. Furthermore, OPT++ comes equipp ...

**Keywords:** Extensibility, Object-relational databases, Query optimization, Software architecture

## 12 Multiple-query optimization

Timos K. Sellis

March 1988 **ACM Transactions on Database Systems (TODS)**, Volume 13 Issue 1

Full text available:  pdf(2.19 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Some recently proposed extensions to relational database systems, as well as to deductive database systems, require support for multiple-query processing. For example, in a database system enhanced with inference capabilities, a simple query involving a rule with multiple definitions may expand to more than one actual query that has to be run over the database. It is an interesting problem then to come up with algorithms that process these queries together instead of one query at a time. Th ...

## 13 Cache investment: integrating query optimization and distributed data placement

Donald Kossmann, Michael J. Franklin, Gerhard Drasch, Wig Ag

December 2000 **ACM Transactions on Database Systems (TODS)**, Volume 25 Issue 4

Full text available:  pdf(210.67 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Emerging distributed query-processing systems support flexible execution strategies in which each query can be run using a combination of data shipping and query shipping. As in any distributed environment, these systems can obtain tremendous performance and availability benefits by employing dynamic data caching. When flexible execution and dynamic caching are combined, however, a circular dependency arises: Caching occurs as a by-product of query operator placement, but query operator pl ...

**Keywords:** cache investment, caching, client-server database systems, data shipping, dynamic data placement, query optimization, query shipping

## 14 Multidatabase systems: Query optimization using fuzzy set theory for multidatabase systems

Qiang Zhu, P. Å. Larson

October 1993 **Proceedings of the 1993 conference of the Centre for Advanced Studies on Collaborative research: distributed computing - Volume 2**

Full text available:  pdf(761.60 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

One of the challenges for global query optimization in a multidatabase system (MDBS) is that some local optimization information may not be accurately known at the global level because of local autonomy. In this paper, we introduce a fuzzy query optimization approach that is based on fuzzy set theory, introduced by Zadeh in the 1960s, to tackle the challenge. We describe the problem of fuzzy query optimization and compare the fuzzy optimization approach with the traditional (crisp) optimization ...


**Keywords:** fuzzy optimization, fuzzy set, multidatabase system, query optimization

## 15

## Query optimization in a memory-resident domain relational calculus database system

Kyu-Young Whang, Ravi Krishnamurthy

March 1990 **ACM Transactions on Database Systems (TODS)**, Volume 15 Issue 1

Full text available:  [pdf\(2.46 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We present techniques for optimizing queries in memory-resident database systems. Optimization techniques in memory-resident database systems differ significantly from those in conventional disk-resident database systems. In this paper we address the following aspects of query optimization in such systems and present specific solutions for them: (1) a new approach to developing a CPU-intensive cost model; (2) new optimization strategies for main-memory query processing; (3) new insight into ...

#### 16 Query processing: A characterization of the sensitivity of query optimization to storage access cost parameters

Frederick R. Reiss, Tapas Kanungo

June 2003 **Proceedings of the 2003 ACM SIGMOD international conference on Management of data**

Full text available:  [pdf\(255.35 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Most relational query optimizers make use of information about the costs of accessing tuples and data structures on various storage devices. This information can at times be off by several orders of magnitude due to human error in configuration setup, sudden changes in load, or hardware failure. In this paper, we attempt to answer the following questions:• Are inaccurate access cost estimates likely to cause a typical query optimizer to choose a suboptimal query plan?• If an optimizer ...

**Keywords:** autonomic computing, computational geometry, databases, parametric query optimization, storage systems

#### 17 A piggyback method to collect statistics for query optimization in database management systems

Qiang Zhu, Brian Dunkel, Nandit Soparkar, Suyun Chen, Berni Schiefer, Tony Lai

November 1998 **Proceedings of the 1998 conference of the Centre for Advanced Studies on Collaborative research**

Full text available:  [pdf\(328.82 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)


A database management system (DBMS) performs query optimization based on statistical information about data in the underlying data-base. Out-of-date statistics may lead to inefficient query processing in the system. Existing solutions to this problem have some drawbacks such as heavy administrative burden, high system load, and tardy updates. To overcome these drawbacks, our new approach, called the piggyback method, is proposed in this paper. The key idea is to piggyback some additional retrieval ...

**Keywords:** access method, cost estimation, database management system, piggyback analysis, query optimization, statistics collection

#### 18 On compile-time query optimization in deductive databases by means of static filtering

Michael Kifer, Eliezer L. Lozinskii

September 1990 **ACM Transactions on Database Systems (TODS)**, Volume 15 Issue 3

Full text available:  [pdf\(3.49 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

We extend the query optimization techniques known as algebraic manipulations with relational expressions [48] to work with deductive databases. In particular, we propose a


method for moving data-independent selections and projections into recursive axioms, which extends all other known techniques for performing that task [2, 3, 9, 18, 20]. We also show that, in a well-defined sense, our algorithm is optimal among the algorithms that propagate data-independent selections through recursion.

**Keywords:** dataflow, deductive databases, filtering, fixpoint, graph representation, inference, projection, recursive rules, selection

19 An overview of query optimization in relational systems

Surajit Chaudhuri

May 1998 **Proceedings of the seventeenth ACM SIGACT-SIGMOD-SIGART symposium on Principles of database systems**


Full text available:  pdf(1.42 MB)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

20 Special issue in parallelism in database systems: Considering data skew factor in multi-way join query optimization for parallel execution

Kien A. Hua, Yo Lung Lo, Honesty C. Young

July 1993 **The VLDB Journal — The International Journal on Very Large Data Bases**, Volume 2 Issue 3

Full text available:  pdf(1.43 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

A consensus on parallel architecture for very large database management has emerged. This architecture is based on a shared-nothing hardware organization. The computation model is very sensitive to skew in tuple distribution, however. Recently, several parallel join algorithms with dynamic load balancing capabilities have been proposed to address this issue, but none of them consider multi-way join problems. In this article we propose a dynamic load balancing technique for multi-way joins, and i ...

**Keywords:** load balancing, multi-way join, parallel-database computer, query optimization

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